# Conservation And The Natural Environment

# 4. Conservation & The Natural Environment

## 4.1. Introduction

The City of Rio Rancho is located within the Middle Rio Grande Valley in the Southern Rocky Mountains. Physiographically, Rio Rancho is situated in one of the series of basins (valleys) surrounded by ranges (mountains) in the southeastern portion of the Basin and Range Province that stretches from Sierra Nevada and southern Cascade Mountains in the northwestern to the Chihuahua Desert to the southeast in Texas and Mexico. Rio Rancho is properly characterized as a semi-arid, high-desert environment with more moderate summer and winter temperatures compared to other parts of the Basin and Range Province.

Because Rio Rancho is located in a semi-arid, high-desert, water availability and how the City conserves its water resources is not only critical to the environment, but water availability is a constraint to development. In order for Rio Rancho to continue to grow as a city, securing additional water resources along with water conservation will be necessary for Rio Rancho's long-term growth.

The Conservation Element addresses the physical and natural environments of the City of Rio Rancho. This element will cover: air quality, water quality, water availability conservation, soils, geological hazards, and arroyos, endangered species, energy conservation, and solid waste and recycling.

## 4.2. Existing Conditions

### 4.2.1 Air Quality

Rio Rancho's location in north, central New Mexico in the Rio Grande Valley gives the City a warm, dry climate with an average annual precipitation of approximately nine inches. See Map C-1 for precipitation in New Mexico. The City's elevation exceeds 5,000 feet above sea level which results in broad daily temperature ranges but extreme high and low temperatures are generally rare. The average daily temperature range in the metropolitan area is approximately 27 degrees, while the average January temperature is 35° F and the average July temperature is 79° F.

Air quality is dependent upon many meteorological factors such as temperature inversions and winds in addition to dust and vehicle emissions. Temperature inversions (a warmer layer of air is sandwiched between colder layers of air above and below) can occur any time of the year; however, as Guyer 2008 shows temperature inversions in the Albuquerque Metro Area are more pronounced during the winter months during cold, clear nights with little to no wind. Temperature inversions cause vehicle emissions to be trapped and thus intensifying air pollution.

Fugitive dust from construction sites is another source that can impede air quality. While Rio Rancho and the Albuquerque Metropolitan Area are not classified as non-attainment areas for PM 2.5 or PM 10 (Particulate Matter below 2.5 or 10 microns), blowing dust and sand can be a source of air pollution during high wind periods.

High pollen counts are another source that impedes air quality. Non-native plant species such as Mulberry and Fruiting Olive Trees, for example, can create high pollen counts during the period in which they are in bloom, thereby causing respiratory difficulties for people sensitive to these allergens.

### 4.2.2 WATER QUALITY

Potable water, or drinking water, is a limited natural resource that is dependent upon rainfall and is provided by the City of Rio Rancho's Utilities Services Division as well as domestic wells. Rio Rancho relies on groundwater sources within Sandoval County for domestic and commercial consumption, as well as for fire protection and irrigation of landscaping. (See Map C-2 for aquifers within New Mexico).

### 4.2.3 WATER AVAILABILITY

Along with antiquated platting, nothing constrains the City of Rio Rancho's ability to grow more than water availability. There are currently 75,681 platted lots within the City of Rio Rancho, the vast majority of these lots are residentially zoned. The overwhelming majority of these lots are located in the Rio Rancho Estates subdivisions. With a lack of infrastructure to much of these lots, property owners must obtain water from on-site wells. The vast majority of these lots fall below the current ¾-acre lot standard established by the State of New Mexico's water engineer. Therefore, locating additional, long-term water sources is necessary for the City of Rio Rancho to grow.

### 4.2.4 CONSERVATION

Because Rio Rancho is located in a high-desert environment, water resources are not as abundant as they are in other parts of the country where precipitation is more abundant. Therefore, water conservation is a critically important aspect of the overall water management plan for the City of Rio Rancho. Examples of water conservation measures include aerators for faucets and showerheads, low-flow toilets, irrigation system timers and monitors, drought-tolerant landscaping, and water-efficient dishwashers and washing machines. Water also can be recycled – car washes, commercial laundries and air-conditioning towers are candidates for reuse as is water used for landscaping. A more thorough discussion of the City of Rio Rancho's water conservation program can be found in the Public Facilities and Services Element.

### 4.2.5 GEOLOGICAL HAZARDS

Rio Rancho is located within the Middle Rio Grande Valley in the southern Rocky Mountains and is part of the Rio Grande Rift. There are 13 faults within Rio Rancho. They are: East Heights Fault Zone, East Doval Fault, East Paradise Fault, Loma Barbon Fault Zone, Mariposa Fault Zone, Picuda Fault, San Ysidro Fault Zone (Calabacillas Segment), Star Heights Fault Zone, Tanaya Fault, West Paradise Fault, Zia Fault, Zia Fault (Centipede Segement), and the Ziana Anticline. Of note in this list of faults is the East Paradise Fault which has produced earthquakes at a magnitude of 7.0. See Map C-3 for faults and Map C-4 for the geologic groups in Rio Rancho.

### 4.2.6 SOILS

There are eight major soil types within the Sandoval County portion of the City of Rio Rancho and eight major soil types within the Bernalillo County portion of the City of Rio Rancho. The soil types in the Sandoval County portion of the city are: Grieta Fine Sandy Loam, found along Calabacillas, La Barranca, and Lomitas Negras; the Clovis Fine Sandy Loam, found along Calabacillas, Montoyas, and Panta de Leon; the Grieta-Sheppard Loamy Fine Sands, found along Panta de Leon, Venada, Black, and La Barranca; the Sheppard Loamy Fine Sand, found along Calabacillas, Montoyas, Venada, and the Lomitas Negras; the Sheppard Loamy Fine Sand, found along Calabacillas, Black, Montoyas, Panta de Leon, Venada, Lomitas Negras, and La Barranca; the Zia-Clovis Association, found along Calabacillas, Montoyas, Panta de Leon and La Barranca and the Gilco loam found at the east end of the Venada Arroyo's conveyance with the Rio Grand River near the northern extent of the River's Edge Unit III Subdivision. The soil types in the Bernalillo County portion of the city are all found within the southwestern portion of the city. These soils types are: Alameda, Bluepoint Loamy Fine Sand 1 to 9% Slope, Bluepoint-Kokan Association-Hilly, Bluepoint Fine Sand-Hummocky, Latene, Madurez-Wink Association Gently Sloping, Madurez Loamy Fine Sand 1 to 5% Slope, Pajarito.

The following soils are found within the Bernalillo County portion of Rio Rancho near the Paradise West and Quail Ranch planned developments: Alameda Sandy Loam, Bluepoint Loamy Fine Sand, Bluepoint-Kokan Association, Bluepoint Fine Sand, Latene Sandy Loam, Madurez-Wink Association, Madurez Loamy Fine Sand, Pajarito Loamy Fine Sand.

A detailed description of all soils profiles can be found in Appendix 1 and Map C-5 shows all soil types within the City of Rio Rancho.

## 4.2.7 ARROYOS

There are nine major watersheds in the City of Rio Rancho that are managed by SSCAFCA – Black Arroyo Watershed, Calabacillas Arroyo Watershed, La Barranca Arroyo Watershed, Montoyas Arroyo Watershed, NM 528 Watershed, Rio Rancho Urban Watershed, Sierra Blanca-Willow Creek Watershed, Venada Arroyo Watershed, Zia Arroyo Watershed, and an unnamed watershed near New Mexico HWY 528 and Idalia Road.

Arroyos can be viewed as both a potential geological hazard and a valuable open space resource. The aforementioned watersheds are proposed to be part of an arroyo park and trail system that the Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) addresses in their Quality of Life Master Plan. SSCAFCA has taken on a secondary roll of open space development and management which is addressed in their Quality of Life Master Plan. The purpose of the Quality of Life Master Plan is: "…..to enable multi-use initiatives that may enhance citizens' outdoor enjoyment as well as provide amenities for properties or neighborhoods adjacent to SSCAFCA lands. Activities proposed in (or adjacent to) flood control facilities must be compatible with the mission of protecting public safety and private property. Improvements should be undertaken only with the understanding that they may be susceptible to flood damage from storm runoff. With these general conditions, jurisdictions, developers and citizen groups are invited to make joint use of Authority lands. A broad vision foresees recreation, alternative transportation, outdoor gathering places, scenic viewpoints, wildlife habitat and cultural resource preservation among many other potential open space advantages." Map C-6 depicts the watersheds and arroyos in Rio Rancho.

## 4.2.8 NATURAL HAZARDS

Rio Rancho conducted a hazards analysis to determine what potential hazards face our community. Our most devastating potential hazards are earthquakes, volcanic eruptions, and tornadoes. However, the probability of occurrence for these hazards is very low. Other significant natural hazards are floods/flash floods, urban and wildland fires, winter storms, wind/dust storms, land subsidence and land slides.

Rio Rancho has experienced the following natural hazards over the course of its 28-year history: wildland fires, winter storms, flash floods, drought, wind storms, lightning and dust storms.

The largest wildland fire burned 45 acres of the Rio Grande bosque in February 1984.

The City's most severe winter storms involved three separate snowstorms with below zero temperatures each day between December 21 & 31, 1990. On April 1, 1988, the City's largest recorded single snowstorm delivered between 11"-14" throughout the metropolitan area.

The City's most serious and recurrent hazards involve drought and flash flooding. The City of Rio Rancho has experienced damaging flash floods 15 different years since 1981 and droughts in five years. Rio Rancho obtained state disaster declarations for flash floods in 1988, 1990 and 1999. The 1999 flash flood resulted in a federal disaster declaration. Each incident caused between $250,000 and $500,000 in damages. Prior to 1981, there were state disaster declarations for flash flooding in 1975 and 1976. Additionally, the City of Rio Rancho was included in drought-related state disaster declarations in 1996 and 2000. The 1996 drought also resulted in a federal disaster declaration.

The most costly flooding to strike Rio Rancho occurred in 2006 when record rainfall inundated the city on June 28, July 10, August 2, and August 6. The flooding from these storms resulted in more than $2.6 million of damage that was reported to the Federal Emergency Management Agency (FEMA).

## 4.2.9 MANMADE HAZARDS

Manmade hazards have included: power outages, water main breaks, sewage spills, hazardous materials incidents and accidents involving multiple casualties, and major structural fires.

The City's costliest urban fire caused more than $100,000 damage in October 1989. The City's largest industrial accident resulted in 13 injuries in November 1993.

Major power outages impacting the entire community occurred in July 1989, December 1990, May 1994 and March 2000.

## 4.2.10 VEGETATION AND ECOSYSTEMS

According to a vegetation map of New Mexico produced by Dr. William Dick-Peddie, Rio Rancho's natural vegetative cover is classified as Plains-Mesa Sand Scrub and Desert Grassland which is common in the "Upper Sonoran" zone. Plant species found in the "Upper Sonoran" zone range from cottonwood "bosque" or riparian habitat along the Rio Grande to an open mesa environment dominated by

wide variety of grasses, yucca, sagebrush and cholla cactus. The City's higher elevations have high concentrations of juniper and a small amount of piñon present. Rio Rancho's bosque supports marsh-like vegetation such as cattail and bulrush as well as exotic species like Russian olive, willows and tamarisk also known as, "salt cedar." Map C-7 depicts the natural vegetative cover of Bernalillo and Sandoval Counties.

### 4.2.11 WILDLIFE

The Upper Sonoran (elev. 5,000-7,000') zone species include the burrowing owl, squirrels, prairie dogs, coyote, fox, bobcat, raccoons, skunk, many lizards, horned toads, scaled quail, roadrunner, black-tailed jack rabbits and cottontail rabbits, a variety of snakes including the western diamondback rattlesnake, predatory birds, mourning dove, badger, porcupine, scorpions and black widow spiders and burrowing rodents. On at least two separate occasions, a mountain lion and a black bear have found their way into the community from adjoining wilderness areas.

Threatened or endangered wildlife known to appear in Bernalillo and Sandoval Counties include: Peregrine Falcon, Whooping Crane, Willow Flycatcher, Meadow Jumping Mouse, Mississippi Kite, Bald Eagle, Jemez Mountain Salamander, Spotted Bat, and the Pine Mart.

### 4.2.12 RESEARCH FACTS

Although most species of aquatic life cannot thrive in the river adjacent to Rio Rancho due to its shallowness, turbidity and water temperature, the river does support an endangered fish species known as the Rio Grande Silvery Minnow. Consequently, development impacts must be closely evaluated to determine the potential impact to this species and be mitigated as necessary. The Rio Grande bosque also provides habitat for beaver and muskrat, a variety of amphibians, migratory waterfowl and songbirds.

### 4.2.13 PHYSICAL ENVIRONMENT

The physical or "built" environment of Rio Rancho like most urbanized areas consists of single-family homes to industrial buildings, churches to civic buildings, roads to water and waste water treatment facilities. Approximately 33% of Rio Rancho's 105 square miles are developed, of that, 39% is residential.

Sustainability was one of the key issues identified in the Strategic Plan. Sustainable Development can be defined as: A development that meets the needs of the present without compromising the ability of future generations to meet their own needs. All development, no matter how sustainable, will have an impact on the natural environment. However, development using the principles of sustainability such as LEED (Leadership in Environmental Design) or LID (Low Impact Development) can minimize the impacts of development on the natural environment. See Appendix 2 for the LEED rating system.

LID (which is focused on storm water management) techniques that can be used to support sustainability include: preserving native vegetation, natural drainages and porous soils; reducing impervious surfaces; diverting runoff from the storm drainage system; limiting total impervious surface on a site; and clustering development. Utilizing LID techniques is especially important in Rio Rancho where erosive soils can be by flash flooding in arroyos.

When environmental goals compete with other City goals, such as those related to economic development, a balance between these goals should occur in order to protect the functions of natural systems and to prevent harmful effects on human health.

## 4.3 IMPLEMENTATION

### 4.3.1 DISCUSSION

During the development of the City of Rio Rancho's Strategic Plan, the Governing Body has determined that environmental stewardship is a core value important to the citizens of the City of Rio Rancho, and it plays an integral role in guiding how the City accommodates growth and provides services. The goals, policies and actions contained herein are intended to help implement the strategies in the Strategic Plan that pertain to the Conservation Element.

Therefore, the city must take a leadership role in delivering services, operating its facilities and managing its land in an environmentally sustainable manner if the city expects developers to build projects consistent with the fundamentals of sustainability.

## 4.3.2 GOALS

**GOAL CON-1:** Preserve water resources.

**GOAL CON-2:** Preserve vegetation and natural resources.

**GOAL CON-3:** Support wildlife habitat of sufficient diversity and abundance to sustain existing indigenous wildlife populations.

**GOAL CON-4:** Meet federal, state, regional and local air quality standards through coordinated, long-term strategies that address the many contributors to air pollution.

**GOAL CON-5:** Meet federal, state, regional and local water quality standards through coordinated, long-term strategies that address the many contributors to water pollution.

**GOAL CON-6:** Ensure the City of Rio Rancho is adequately prepared for natural and manmade disasters.

## 4.3.3 POLICIES

**POLICY CON-1:** Conserve groundwater resources to ensure the city's long-term water needs are met.

**POLICY CON-2:** Consider the immediate and long range environmental impacts of policy and regulatory decisions and evaluate those impacts in the context of the city's commitment to provide for public safety, infrastructure, and economic development, in a sustainable environment.

**POLICY CON-3:** Reuse and recycle materials, reduce waste and dispose of all wastes in a safe and responsible manner.

**POLICY CON-4:** Promote growth management strategies that protect air, water, land, and energy resources consistent with Rio Rancho's role as the third largest city in the state.

**POLICY CON-5:** Integrate site-specific development standards in areas where arroyos exist to manage and protect the functions of these critical areas.

**POLICY CON-6:** Provide incentives for developers to implement the use of low impact development techniques and green building practices.

**POLICY CON-7:** Employ the best management practices and technology, education, and enforcement strategies to minimize non-point source pollution.

**POLICY CON-8:** Promote soil stability through the use of the best available technology where practical.

**POLICY CON-9:** Preserve and enhance native vegetation along arroyos identified in SSCAFCA's Quality of Life Master Plan.

**POLICY CON-10:** Promote the use of alternative fuels such as electricity and compressed natural gas.

**POLICY CON-11:** Identify methods to reduce the sources of dust within the City of Rio Rancho.

**POLICY CON-12:** Develop and protect a public open space network.

## 4.3.4 ACTIONS

**ACTION CON-1:** The city shall replace its current vehicle fleet with more energy-efficient vehicles once a vehicle has surpassed its useful life where it is fiscally responsible and a similar alternative fuel vehicle is available.

**ACTION CON-2:** Identify and secure a long-term water supply necessary to provide sufficient water resources that will support Rio Rancho's future growth.

**ACTION CON-3:** Amend the zoning ordinance to limit the use of turf in landscape areas in residential and commercial developments, as well as non-recreational facilities operated by government agencies.

**ACTION CON-4:** Amend the zoning ordinance to require property owners adjacent to arroyos to incorporate suitable indigenous or non-native xeric plants adjacent to an arroyo to stabilize arroyo banks.

**ACTION CON-5:** Monitor developments to ensure soil erosion measures are in place both during and post construction through the use of the best available technologies, where practical, to reduce non-point source pollution.

**ACTION CON-6:** Stabilize arroyo banks along tributaries of the Rio Grande if necessary by using bioengineering techniques except where hydrology, excessive cost, or other factors make this approach infeasible.

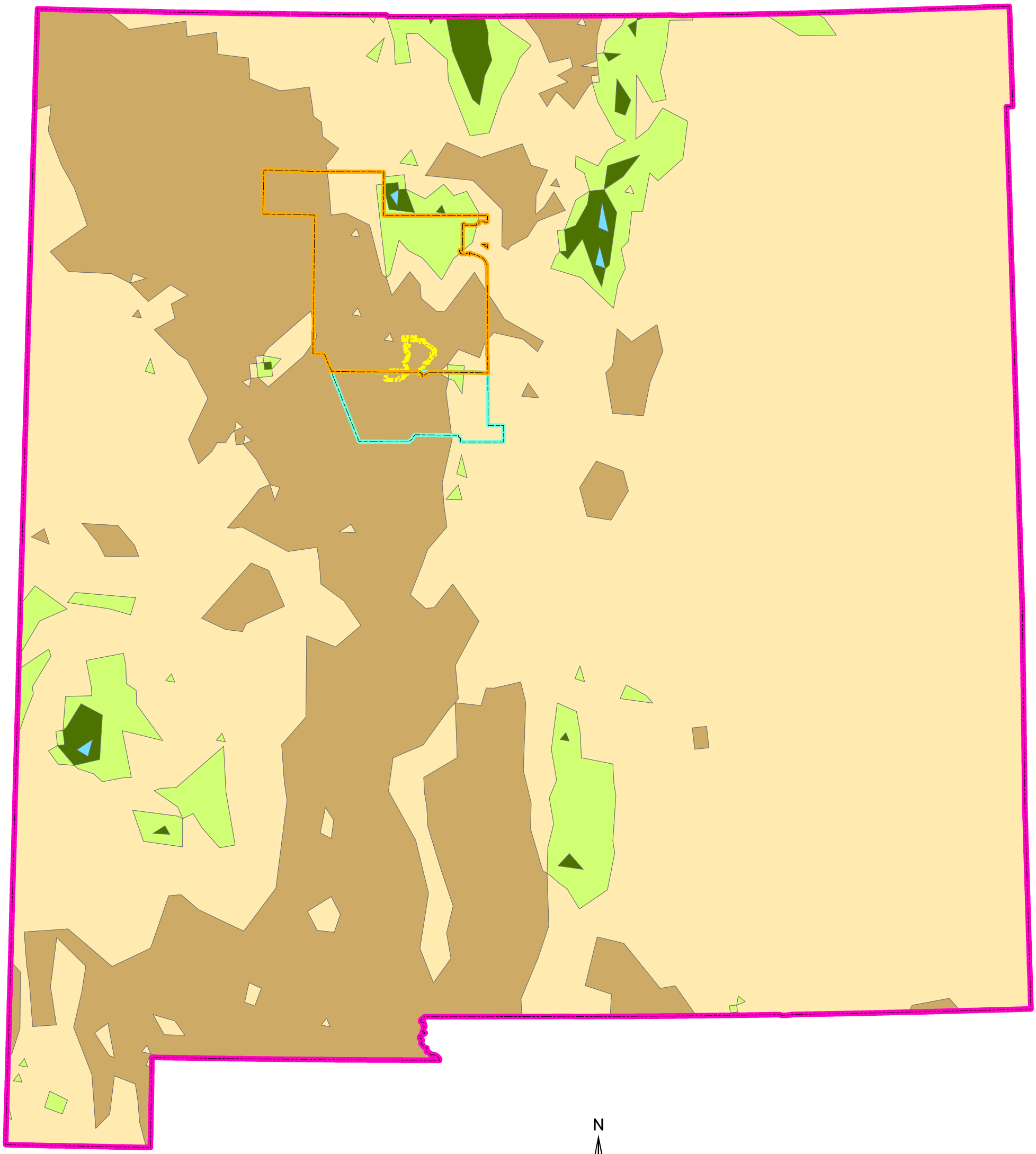
**ACTION CON-7:** Create a hillside development ordinance to place restrictions for development on steep hills.

**ACTION CON-8:** Seek grants and other fiscal resources to acquire open space.

**ACTION CON-9:** Reduce the amount of air-borne particulates through a street sweeping program, dust abatement on construction sites, and other methods to reduce the sources of dust.

**ACTION CON-10:** Utilize SCCAFCA's flood control and arroyo features as a part of the City's open space network.

**POLICY CON-13:** Identify sites necessary for open space.



LEGEND

- New Mexico State Line
- Sandoval County Line
- Bernalillo County Line
- Rio Rancho City Limit

**NewMexicoPrecipitation**

**INCHES**

- 5.01 - 12.00
- 12.01 - 20.00
- 20.01 - 30.00
- 30.01 - 40.00
- 40.01 - 50.00

N

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0 25 50 100 150 200

Miles

# MAP C-1: NEW MEXICO PRECIPITATION

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LEGEND

- Basin and Range Basin-Fill Aquifers
- Colorado Plateaus Aquifers
- High Plains Aquifer
- Other Rocks
- Pecos River Basin Alluvial Aquifer
- Rio Grande Aquifer System
- Roswell Basin Aquifer System
- New Mexico State Line
- Sandoval County Line
- Bernalillo County Line
- Rio Rancho City Limit

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# MAP C-2: NEW MEXICO'S AQUIFERS

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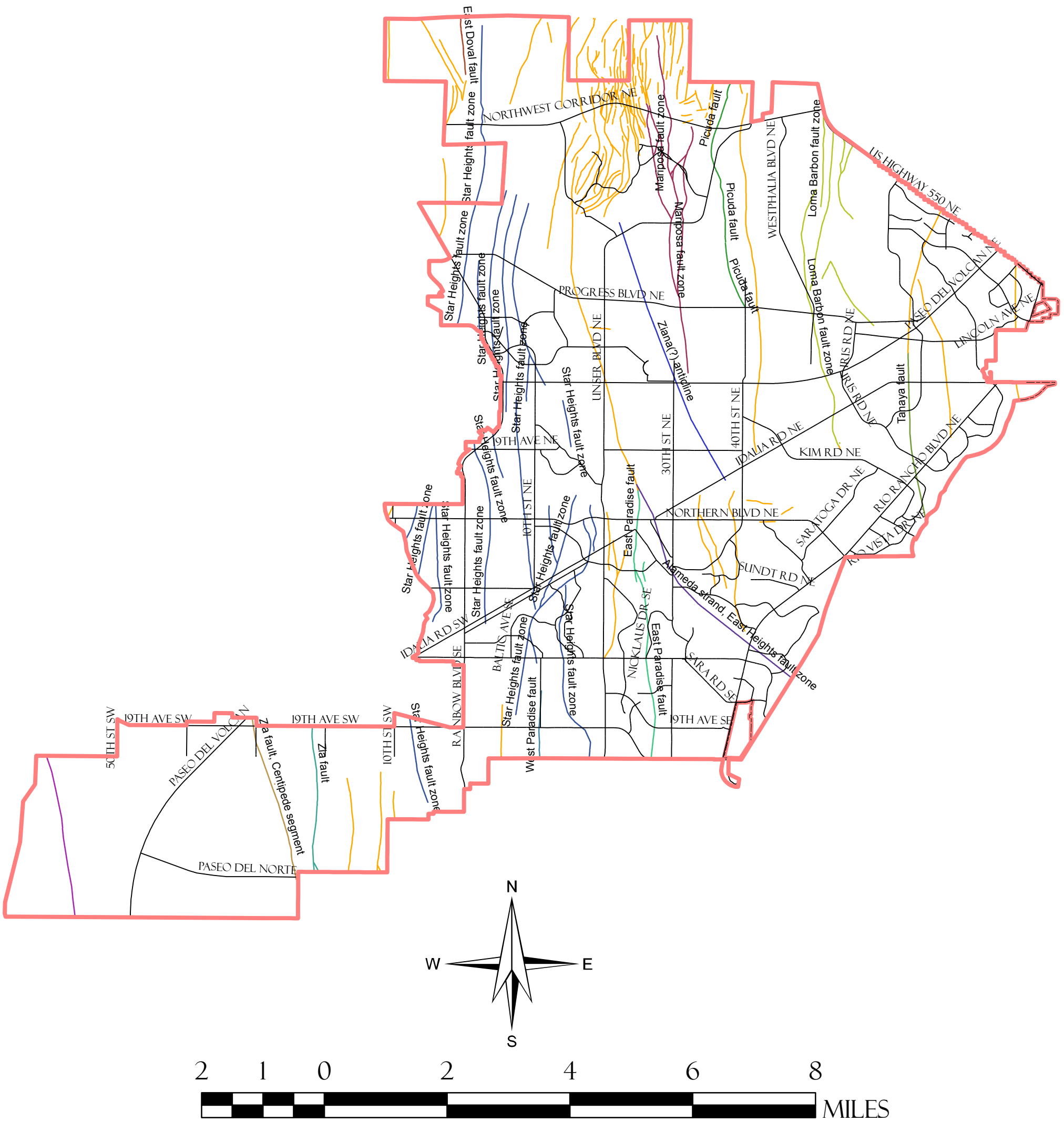


# MAP C-3: GEOLOGIC FAULTS IN RIO RANCHO

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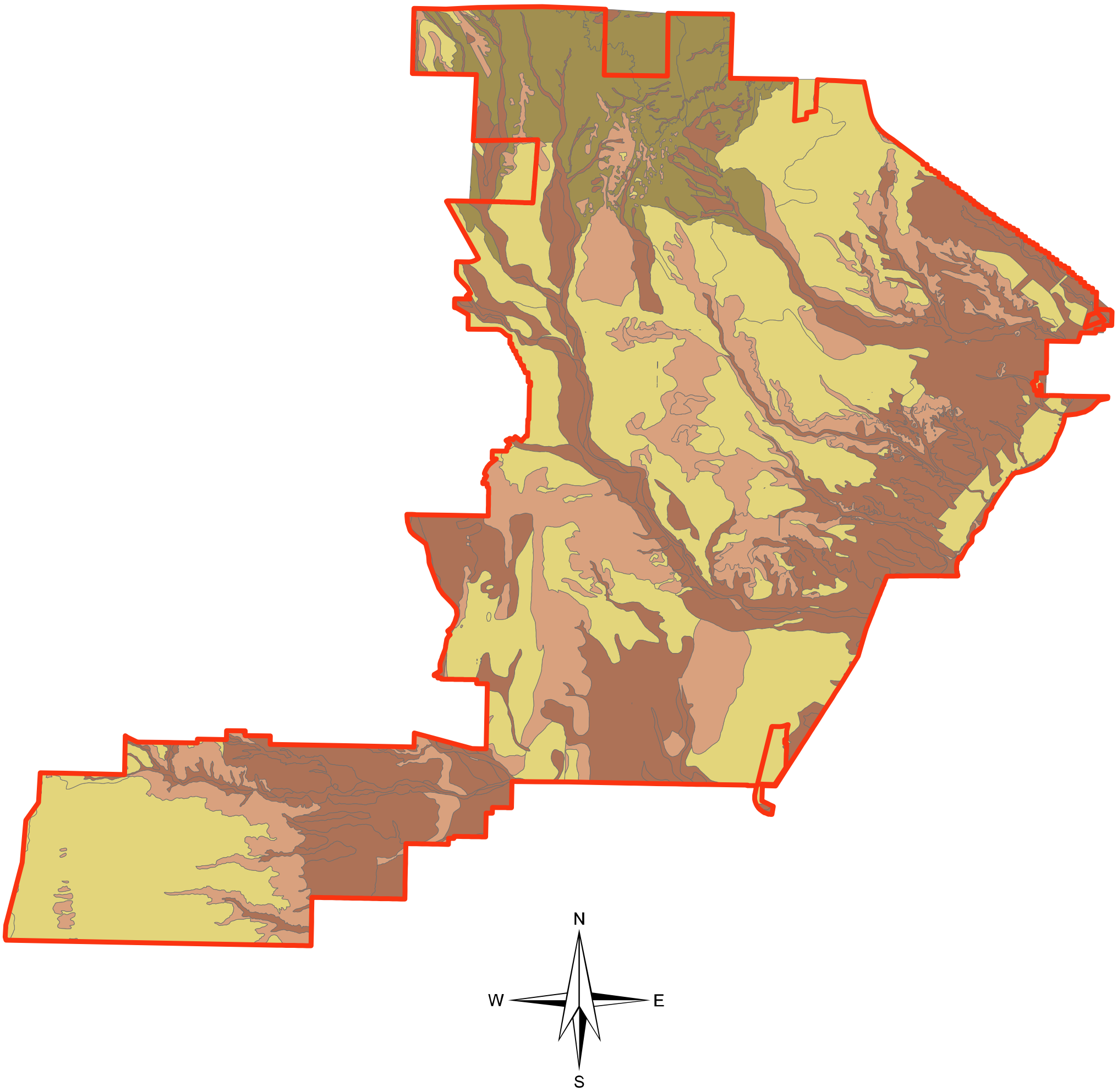


LEGEND

- Rio Grande Valley Group
- Surficial deposits
- Middle Santa Fe Group
- Upper Santa Fe Group
- Boundary

# MAP C-4: GEOLOGICAL GROUPS IN RIO RANCHO

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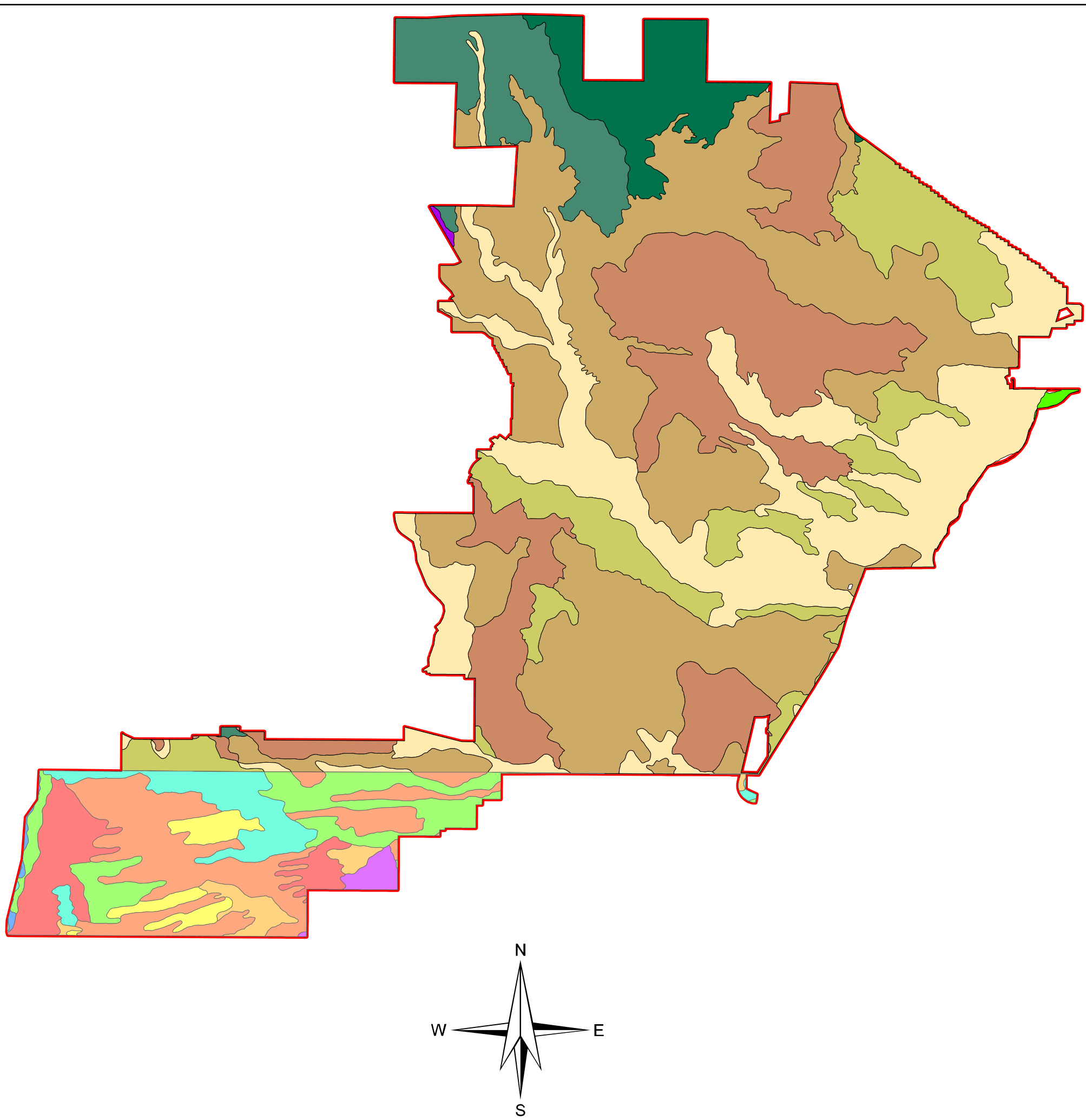


LEGEND

Bernalillo County Soils

- Alemeda Sandy Loam 0-5%
- Bluepoint Loamy Fine Sand 1-9%
- Bluepoint-Kokan Association Hilly
- Bluepoint Fine Sand Hummocky
- Latene Sandy Loam 1-5%
- Madurez-Wink Association Gently Sloping
- Madurez Loamy Fine Sand 1-5%
- Pajarito Loamy Fine Sand 1-9%

Sandoval County Soils

- Grieta Fine Sandy Loam 1-4%
- Clovis Fine Sandy Loam 1-4%
- Grieta-Sheppard Loamy Fine Sands 2-9%
- Sheppard Loamy Fine Sand 8-15%
- Sheppard Loamy Fine Sand 3-8%
- Zia-Clovis Association 2-10%
- Pinavetes-Rock Outcrop Complex 15-35%
- Gilco Loam 1-4%
- Rio Rancho City Limit

# MAP C-5: RIO RANCHO SOILS

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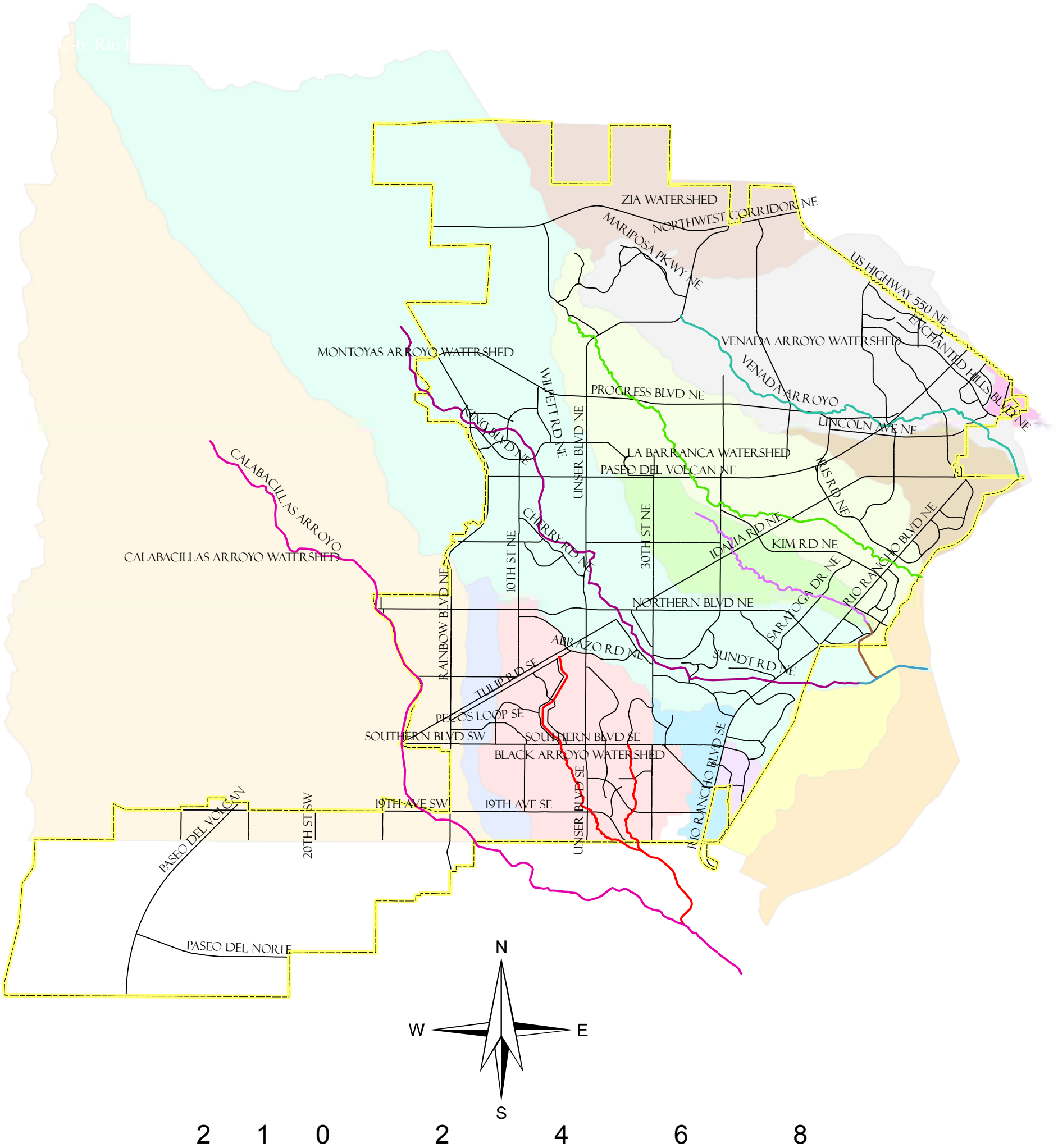


| WATERSHED NAME | | |
|---|---|---|
| Black Arroyo Watershed | NM528 Watershed | Black Arroyo |
| Calabacillas Arroyo Watershed | Rainbow Tributary | Calabacillas Arroyo |
| Corrales East Watershed | Rio Rancho Urban Center Watershed | Dulcelina Curtis Channel |
| Corrales West Watershed | Unnamed Arroyo Watershed | Harvey Johnes Channel |
| La Barranca Watershed | Unnamed Wash Watershed | La Barranca Arroyo |
| Lomitas Negras Watershed | Venada Arroyo Watershed | Lomitas Negras Arroyo |
| Montoyas Arroyo Watershed | Zia Watershed | Montoyas Arroyo |
| | | Venada Arroyo |

# MAP C-6: RIO RANCHO ARROYOS & WATERSHEDS

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LEGEND

- Bernalillo Township Limits
- Rio Rancho City Limits
- Sandoval County Line
- Bernalillo County Line

- ALPINE TUNDRA
- CHIHUAHUAN DESERT SCRUB
- CLOSED BASIN SCRUB
- CONIFEROUS AND MIXED WOODLAND
- DESERT GRASSLAND (ECOTONE)
- GREAT BASIN DESERT SCRUB
- JUNIPER SAVANNA (ECOTONE)
- LAVA BEDS
- MONTANE CONIFEROUS FOREST
- MONTANE GRASSLAND
- MONTANE SCRUB
- PLAINS-MESA GRASSLAND
- PLAINS-MESA SAND SCRUB
- SAND DUNES
- SUBALPINE CONIFEROUS FOREST
- URBAN, FARMLAND OR OPEN WATER

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MILES

# MAP C-7: CENTRAL NEW MEXICO'S NATURAL VEGETATIVE COVER

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